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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,895	10/06/2006	Tetsuya Makimura	MITPA14.001APC	7596
7590 09/02/2008 MAKIMURA TETSUYA 126-203, NAMIKI 2-CHOME TSUKUBA-SHI, IBARAKI, 305-0044 JAPAN				
EXAMINER HO, ALLEN C				
ART UNIT 2882		PAPER NUMBER		
MAIL DATE 09/02/2008		DELIVERY MODE PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/597,895

**Applicant(s)**

MAKIMURA ET AL.

**Examiner**

Allen C. Ho

**Art Unit**

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 20060810
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:  $\psi$  (paragraph [0046]).
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 6 (Fig. 7).
3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the Wolter mirror as claimed in claims 6 and 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States,

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-5 and 7-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Takenaka *et al.* (U. S. Patent No. 6,625,251 B2).

With respect to claim 1, Takenaka *et al.* disclosed an optical processing apparatus that comprises: a light source part, the light source part generates ultraviolet light and/or soft x-ray (column 15, lines 5-7) by irradiation of a target (32) with laser light focused using a light-focusing optics system (a light-focusing optics system is evidenced by focused laser light beams 31-1 and 31-2 shown in Figs. 3A-3D); and a light-focusing irradiation means comprising an optics system (34) to focus the ultraviolet light and/or soft x-ray.

With respect to claim 3, Takenaka *et al.* disclosed the optical processing apparatus according to claim 1, wherein the optics system to focus the ultraviolet light and/or soft x-ray is an ellipsoidal mirror, and wherein the light source part is positioned at one of the two focal

points of the ellipsoidal mirror, and the ultraviolet light and/or soft x-ray reflected by the ellipsoidal mirror is focused on the other focal point (column 14, line 59 - column 15, line 19).

With respect to claim 4, Takenaka *et al.* disclosed the optical processing apparatus according to claim 1. Since claim 4 fails to set forth additional structural limitations, claim 4 is rejected with claim 1. Note: Equation 7 is automatically satisfied by an ellipsoidal mirror when the light source part is positioned at one of the two focal points of the ellipsoidal mirror. Furthermore, although equation 7 recites an ellipsoidal mirror having a length  $2w$  in the rotation axis direction, claim 4 does not actually claim an ellipsoidal mirror having a length  $2w$  in the rotation axis direction.

With respect to claim 5, Takenaka *et al.* disclosed the optical processing apparatus according to claim 1, wherein the optics system to focus the ultraviolet light and/or soft x-ray is constituted by a rotary paraboloidal mirror (column 14, lines 46-58) or a rotary ellipsoidal mirror (column 14, line 59 - column 15, line 19).

With respect to claim 2, Takenaka *et al.* disclosed an optical processing apparatus that comprises: a light source part, the light source part generates ultraviolet light and/or soft x-ray (column 15, lines 5-7) by irradiation of a target (32) with laser light focused using a light-focusing optics system (a light-focusing optics system is evidenced by focused laser light beams 31-1 and 31-2 shown in Figs. 3A-3D); and a patterning and irradiating means comprising an optics system (34) to focus the ultraviolet light and/or soft x-ray.

With respect to claim 8, Takenaka *et al.* disclosed the optical processing apparatus according to claim 2, wherein the optics system to focus the ultraviolet light and/or soft x-ray is an ellipsoidal mirror, and wherein the light source part is positioned at one of the two focal

points of the ellipsoidal mirror, and the ultraviolet light and/or soft x-ray reflected by the ellipsoidal mirror is focused on the other focal point (column 14, line 59 - column 15, line 19).

With respect to claim 9, Takenaka *et al.* disclosed the optical processing apparatus according to claim 2. Since claim 9 fails to set forth additional structural limitations, claim 9 is rejected with claim 2. Note: Equation 7 is automatically satisfied by an ellipsoidal mirror when the light source part is positioned at one of the two focal points of the ellipsoidal mirror. Furthermore, although equation 7 recites an ellipsoidal mirror having a length  $2w$  in the rotation axis direction, claim 9 does not actually claim an ellipsoidal mirror having a length  $2w$  in the rotation axis direction.

With respect to claim 10, Takenaka *et al.* disclosed the optical processing apparatus according to claim 2, wherein the optics system to focus the ultraviolet light and/or soft x-ray is constituted by a rotary paraboloidal mirror (column 14, lines 46-58) or a rotary ellipsoidal mirror (column 14, line 59 - column 15, line 19).

With respect to claim 7, Takenaka *et al.* disclosed an optical processing method that comprises: focusing and irradiating a laser beam (31-1, 31-2) at a light source part onto a target (32) through a light-focusing optics system (a light-focusing optics system is evidenced by focused laser light beams 31-1 and 31-2 shown in Figs. 3A-3D), and generating ultraviolet light and/or soft x-ray that allows a work to effectively absorb light; and focusing the ultraviolet light and/or soft x-ray to high energy density in accordance with the wavelength of the ultraviolet light and/or soft x-ray using an ellipsoidal mirror (34), irradiating the work with the focused ultraviolet light and/or soft x-ray at high energy density in a specified pattern, and processing and/or refine the work (column 1, lines 11-17).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takenaka *et al.* (U. S. Patent No. 6,625,251 B2) as applied to claims 1 and 2 above, and further in view of Levine *et al.* (U. S. Patent No. 6,389,101 B1).

With respect to claims 6 and 11, Takenaka *et al.* disclosed the optical processing apparatus according to claims 1 and 2. However, Takenaka *et al.* did not disclose an optics system constituted as a Wolter mirror comprising a combination of rotary hyperboloidal mirror and rotary ellipsoidal mirror.

Levine *et al.* disclosed a Wolter mirror (60) comprising a combination of rotary hyperboloidal mirror and rotary ellipsoidal mirror. Levine taught that substituting a Wolter mirror for an ellipsoidal mirror improves control over the fidelity of the image of a source (column 5, lines 24-35).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the optics system disclosed by Takenaka *et al.* with a Wolter mirror, since a person would be motivated to maintain the fidelity of the image of the source.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Tran *et al.* (U. S. Patent No. 7,079,224 B2) disclosed an arrangement for debris reduction in a radiation source based on a plasma.
- (2) Chen (U. S. Patent No. 6,317,483 B1) disclosed a doubly curved optical device.
- (3) Barbee, Jr. *et al.* (U. S. Patent No. 6,278,764 B1) disclosed an x-ray optics.
- (4) Yan *et al.* (U. S. Patent No. 5,812,631) disclosed a monolithic capillary x-ray lens.
- (5) Kato *et al.* (U. S. Patent No. 5,619,382) disclosed an imaging optical system.
- (6) Nagai *et al.* (U. S. Patent No. 5,434,901) disclosed a soft x-ray microscope.
- (7) Tersawa *et al.* (U. S. Patent No. 5,222,112) disclosed a reflective reduction projection optical system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Allen C. Ho/  
Primary Examiner  
Art Unit 2882

28 August 2008